

student, for the doctor who is interested in a most lively growing point in medicine and to Medical Officers of Health who, thanks to antibiotics, are now concerned increasingly with inherited defects, particularly those producing mental disorders.

C. A. CLARKE

Lerner, I. Michael. *The Genetic Basis of Selection*. New York, 1958. (London, Chapman and Hall). Pp. xvi+298. Price 64s.

THE GENETIC BASIS of selection is, Darwin would say, variation. Although Professor Lerner is an admirer of Darwin, that is not what he means to discuss. Indeed he manages to avoid this apparent foundation of his subject. What he discusses is the present genetic theory of selection, the theory advanced by those who make systematic experiments on the artificial selection of quantitative or measurable differences in inbred stocks of certain animals, particularly the domestic fowl. To this he adds many well-chosen allusions and opinions derived from the study of natural populations in *Drosophila*. The result is a synthesis of great value to the specialized student of these problems, both present value and historical value. What is it, however, as a contribution to biology? Does it, we must also ask, contribute to the understanding of selection in man? The answer has to be: hardly anything. It is no use, for example, to tell us that Dobzhansky thinks coadaptation is important. What we want to know is the evidence; and also the argument. It is no use to tell us that Haldane thinks small selection pressures produce big results. We should like to know what happens, for example, to the small selection pressures when there are big selection pressures elsewhere.

The trouble is that Professor Lerner's model of variation is much too neat. Like many others, he has tried to develop a model for mathematical treatment, and the model fits the method but it does not fit nature. The gene-pool is a great advance on no gene-pool but it is not enough. Classical analytical genetics is not enough to describe variation and it is not enough therefore as a "basis of selection". It

is, however, all we can do so far for the practical breeder trying to improve his stock and he will be indebted to Professor Lerner for putting the theory on paper.

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Cold Spring Harbor Symposia on Quantitative Biology. *Exchange of Genetic Material: Mechanisms and Consequences*. Volume 23. Cold Spring Harbor, L.I., New York, 1958. Pp. xvi+433. 106 figs. 2 plates. Price \$8.00.

EXCHANGE OF GENETIC material has been understood for fifty years to refer to crossing over between chromosomes. The process was inferred either from linkage experiments or from observations of chromosomes at meiosis. To-day the field has extended to new forms of exchange in fungi and bacteria. Most recently it has extended to viruses in their relations with plants, animals, human beings, and one another and, especially in the phage viruses, with bacteria. Related to these is the problem of how the DNA which underlies the propagation of chromosomes and viruses itself reproduces at the time of crossing over or recombination. All these problems are discussed in the present symposium.

In addition physiological problems of interaction or "complementation" between mutations of different parts of the same gene or adjoining genes are discussed in fungi as well as in phages. Cytoplasmic variations interacting with nuclear differences are described in fungi. A group of exceptional types of behaviour which do not fit crossing over theory are described in flowering plants, animals and fungi. These are commonly and jointly known as "conversion". They also are discussed here from several points of view. The same applies to "paramutation" in maize.

The enquiry is broadened to include recombination in the study of the non-random distribution of inversions in natural populations of various plants and animals. Here the problem is the control of recombination by natural selection. This kind of study leads on to the discussion of various aspects of the evolution of genetic systems by two very able Californian botanists, Verne Grant and Stebbins. Grant